Response to Harmful Algal Blooms (HAB) in Kansas: Summary of Activities for 2012

Kansas Department of Health and Environment

Overview

The Harmful Algal Bloom (HAB) response team, coordinated by the Kansas Department of Health and Environment (KDHE), seeks to inform the public and create an adequate level of awareness about the risks and hazards to human and animal health represented by HABs in recreational public waters in Kansas. The response team is composed of representatives of key organizations who meet once a week during the HAB season of each year for decision-making and planning purposes. The KDHE Bureau of Environmental Field Services (BEFS) leads the fresh water sampling activities. Based on water sampling analysis, the KDHE team makes recommendations to lake managers regarding the issuance of public health alerts. Kansas HAB response is based on a passive surveillance system that relies heavily on reports from lake management officials and the public to KDHE regarding publicly accessible recreational water bodies.

Partners

The HAB response team collaborates with federal, state, local and academic organizations and includes the following agencies: Kansas Department of Wildlife Parks and Tourism (KDWP&T), US Army Corps of Engineers (ACE), Kansas State Veterinary Diagnostic Laboratory (KSVDL), Kansas State University Extension Office, US Geological Survey, local public health departments, municipalities, county parks and recreation departments, Kansas Department of Agriculture (KDA) and the Kansas Water Office (KWO).

Updates on Policies and Procedures

Team Goal: Prevent human and animal illnesses, injuries and deaths associated with HAB.

<u>HAB Response Plan</u>

- The HAB response plan outlines the procedures to identify and confirm the existence of a bloom and defines roles and tasks performed by the various team members. The following is an example of the flow of activities that follow a typical HAB report:
    - The KDHE is notified of HAB by the public, KDWP&T, ACE and lake managers. This is mostly accomplished through an online reporting system.
    - Verification of the HAB compliant occurs by the Bureau of Environmental Health (BEH) KDHE
    - If HAB is validated, KDHE, ACE, or KDWP&T staff are dispatched for collection of samples
    - Water samples are analyzed by the KDHE BOW

- Based on the microcystin concentration level or the number of blue-green algae cell counts, if warranted, KDHE will issue public health recommendations regarding recreation and water supply use at that specific water body
- The team convenes through weekly conference calls
- Public health alerts are issued by the relevant authorities then public drinking water suppliers are notified, if indicated, and offered technical assistance
- Healthcare professionals are informed via the Kansas Health Alert Network about public health alerts in their area
- The public in informed using news releases, print and electronic media.

KDHE Guidelines

- In the United States, there are currently no federal guidelines for monitoring recreational hazards associated with cyanobacteria; however, many states have established guidance values for determining certain measures to protect the public's health. The World Health Organization (WHO) has established guideline values for exposure to cyanobacteria, including microcystin toxin, for recreational activities. These guidelines serve as a reference for KDHE recommendations for posting public health alerts, which reflect an assessment of the level of risk to human and animal health based on water testing results.

Table 1:1 KDHE guidelines for recommending public health alerts and protective actions.

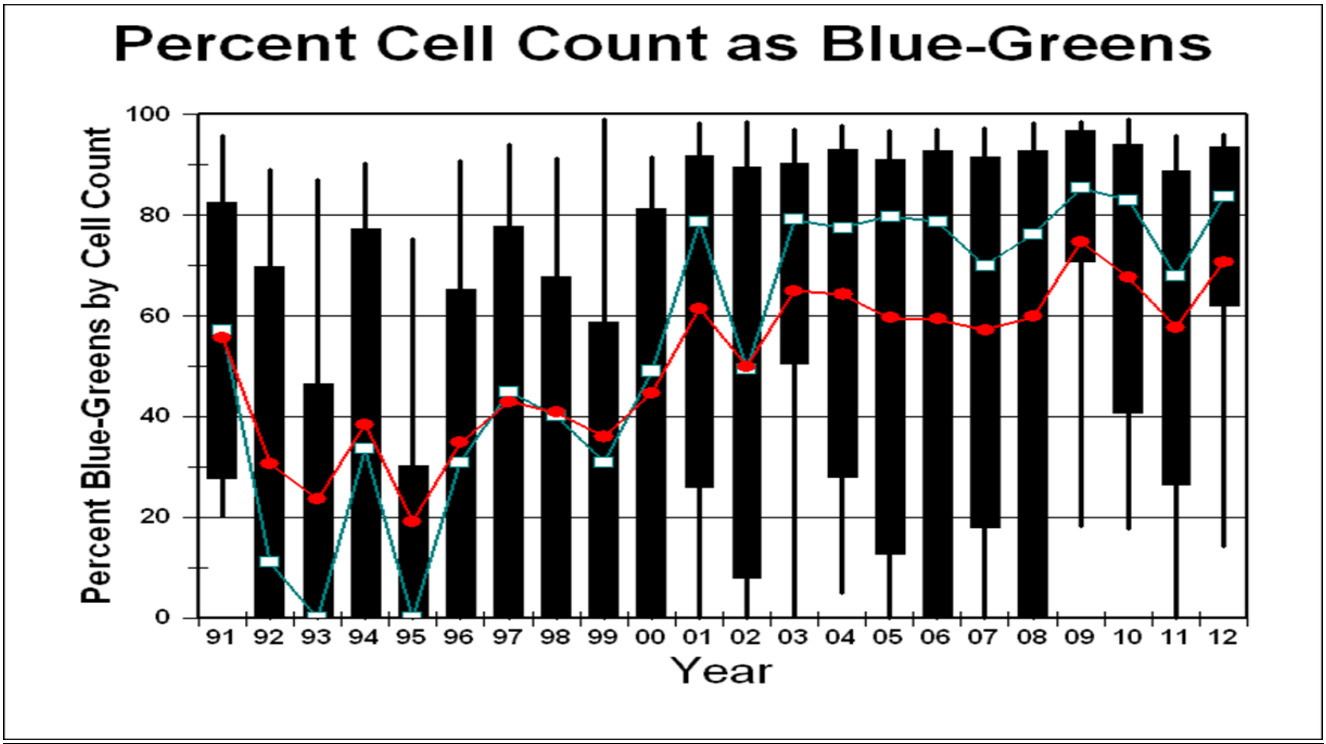
Test Values	Alert Level	Recommended Actions
• Microcystin toxin detectable to ≥ 4 to <20 ug/L ***or*** • > 20,000 to 100,000 cells/mL	Advisory	• Post signage • Discourage direct contact • Notify local health departments, healthcare providers, veterinarians • Notify public water suppliers • Issue media release • Re-test within 4 weeks
• Microcystin toxin ≥ 20 ug/L ***or*** • > 100,000 cells/mL	Warning	• Post signage • Prevent direct contact • Notify local health departments, healthcare providers, veterinarians • Notify public water suppliers • Issue media release • Re-test within 1 week

Statistics from Watershed Monitoring and Assessment Activities at KDHE

In Kansas, 22 of 26 state parks are adjacent to federal and state reservoirs with an estimated 6,100,000 visits to these parks in 2012. There were 46 requests to sample Kansas water bodies submitted to KDHE using the online reporting form. In 2012, 17

lakes were placed under a “Warning” status and 23 were placed under an “Advisory” status. Table 2:1displays the blue-green algae occurrence over a reasonable cross section of lakes around the state since 1991. The data indicate there has been an increase in the percent of the total cell count due to blue-greens over time, particularly since 2000.

Table 2:1 Blue-green Algae percent cell count Trend over the Past Two Decades in Kansas



LEGEND
Mean for Year
Median Values for year

Each lake and algae bloom is treated as unique and based on those data, HAB cell concentrations and microsystin toxin levels are related but their relationship is non-linear in Kansas lakes.

Statistics from Human and Animal Health Surveillance Activities for 2012

- From May 1st to October 31st, 2012, there were 8 reports of HAB-related human illnesses. Four were considered as not related to HAB, two were classified as probable, and two were classified as confirmed based on physician reports.
    - Symptoms presented by complainants.
        - 75% eye and upper respiratory irritation (3 out of 4)
        - 25% rash (1 out of 4)

- 75% gastrointestinal disorders (3 out of 4)
- There were no HAB-related animal deaths or illnesses reported to KDHE in 2012

Current Efforts to Reduce Nutrients in Streams, Lakes and Reservoirs

The Bureau of Water and Bureau of Environmental Field Services at KDHE continue to work toward nutrient reductions from point and non-point sources located in the watersheds of lakes and reservoirs, including those afflicted with HABs in 2012. Ongoing monitoring of streams help locate watersheds contributing large nutrient loads to downstream waters. Point sources, governed by conditions in their National Pollutant Discharge Elimination System (NPDES) permits, are working toward installing nutrient removal technology to lessen the phosphorus and nitrogen content of their wastewater discharged to streams and lakes. Watershed plans crafted by local and regional Watershed Restoration and Protection Strategy (WRAPS) groups, direct Best Management Practices (BMP) toward abating nutrient loads coming from unpermitted non-point sources such as cropland, livestock, septic systems and runoff from small towns. Total Maximum Daily Loads (TMDLs) establish appropriate nutrient load levels for lakes suffering from eutrophication (excessive enrichment by nutrients) which will often spur HABs. While water quality planning is setting the stage for nutrient reduction goals that benefit lakes, implementation of those plans is the key to success, requiring time, financial resources and a willingness by land stewards to participate in the programs designed to reduce the loading of nutrients into Kansas waters. A multi-agency nutrient reduction framework continues to direct application of those programs, as well as setting priorities among Kansas watersheds for financial assistance and seeking ways to bolster that assistance through increased funding.

Conclusion

There were fewer reports of human and animal illnesses in 2012 compared to the previous two years and no dog deaths attributed to HAB. If this reduction holds over time, it may indicate that targeted, well-crafted communications with the public and the strong HAB response team partnership currently in place are effective. Continuous monitoring remains warranted.

Since KDHE does not test private lakes or ponds for blue-green algae, a partnership was developed with the Kansas State Veterinary Diagnostic Laboratory to provide blue-green algae testing for those private water bodies. Finally, HABs continue to be a public health threat to both humans and animals as long as Kansans continue to enjoy water-related activities and excessive nutrients find their way into those waters. Vital partnerships that include federal, state and local government and academia are essential in providing an effective response to HABs in order to protect the health and environment of all Kansans.

Harmful Algal Blooms (HAB) in Kansas: Quick Summary for 2012

Kansas Department of Health and Environment

A Harmful Algal Bloom (HAB) response team coordinated by the Kansas Department of Health and Environment addresses the threat to humans and animals presented by HABs in Kansas.

Goal:
Prevent human and animal illnesses, injuries and deaths associated with HAB.

2012 Season (May 1– October 31) in Numbers:

Lake Status and Water Sampling Activities:

➢ Number of public water body tests requested	46
➢ Number of Kansas water bodies affected by HAB	26
➢ Number of Kansas counties affected by HAB	18
➢ Kansas lakes under a Warning status only	17
➢ Kansas lakes under an Advisory status only	23
➢ Number of water samples analyzed	207

Human Illnesses Surveillance:

➢ Reported	4
➢ Probable	2
➢ Confirmed	2

Primary Complaints in Humans:

- 75% eye and upper respiratory irritation
- 25% rash
- 75% gastrointestinal disorders

Animal illnesses Surveillance:

- There were no pet animal illnesses reported to KDHE
- The Kansas State Veterinary Diagnostic Laboratory reported 20 confirmed cattle deaths due to HAB in private pasture ponds